

1302 Brevig Mission to Teller Intertie - Completion  
Closeout Summary Report  
December, 2014

This Closeout Summary Report is filed with the federal grantor agency the Denali Commission (“Denali” or “DC”) by its grantee partner Alaska Village Electric Cooperative, Inc. (AVEC). The federal grant award covered by this report is Denali award 01302-00 (“1302”). 1302 funded the completion of construction of an energy project known as the Brevig Mission – Teller Intertie (“intertie”) that was formerly reported on under DC project 70C. The intertie was also funded by other federal awards and grantee match, as further explained herein.

This report represents the project status as of December 31, 2014 (except for cost figures, which are expressed as of December 31, 2013).

**Background** - This project impacts the remote rural communities of Brevig Mission, Alaska (pop. 360) and Teller, Alaska (pop. 260). Teller is located 72 road miles northwest of Nome on Alaska’s Seward Peninsula; a summer season, unpaved road connects Teller to Nome. Teller is situated on a spit between Port Clarence (west of Teller) and Grantley Harbor (east of Teller). Brevig Mission is located off the road system and on the north side of Port Clarence, 5 miles northwest of Teller. Both communities are organized as second-class city governments, and both are located in the Cape Nome Recording District. The climate is maritime when ice-free, and then changes to a continental climate after freezing. Grantley Harbor is generally ice-free from early June to mid-October. The two local economies are based on subsistence activities supplemented by wage earnings. The primary employers are the two city governments, the regional school district, and local stores.

The grantee for this project is Alaska Village Electric Cooperative (AVEC), with additional community stakeholders being the electric consumers in the communities of Teller and Brevig Mission, Alaska – residences, and commercial and community facilities.

**Activities** - Project scope included the planning, permitting, design, and construction of a new, three-phase primary intertie from Brevig Mission to Teller, plus modifications to the existing power distribution systems in both communities as necessary to connect them to the intertie. The intertie was intended to allow the electrical demands of Teller and Brevig Mission to be served by the modern AVEC power plant installed in Brevig Mission (completed 2010). That power plant (Denali project 23B/1053) and the AVEC bulk fuel storage project that supplies it (Denali project 1055) were built of sufficient size to serve both communities, under the assumption that this intertie would be completed.

Initial planning for the intertie project started in 2004, around the time AVEC began acquisition of the electric utility in Teller; at the time, AVEC was already serving the electric needs of Brevig Mission. The preconstruction processes of planning, design, permitting, evaluation of alternatives and final decisions regarding route, materials and installation methods for this project were accomplished during the 2004 – 2010 period, and are discussed at length in the Award Transition and Closeout Summary Report for DC project 70C, dated June 30, 2011. The “Hybrid Alternative” emerged as the preferred alternative for final design and construction, primarily because it was determined to be constructible within the budget set by total available funding, while overcoming local public concerns over aesthetics and potential long term negative effects on subsistence hunting and gathering, as well as U.S. Fish and Wildlife Service’s concerns regarding potential effects on migratory birds.

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Procurement started in the winter of 2010 – 2011, and all major materials were shipped to the site in spring and summer 2011. Construction started in September 2011. Overland sections of the intertie comprised of above-ground conductor on poles were installed by AVEC staff linemen; overland sections comprised of below-ground conductor in buried trenches were installed by STG Incorporated (“STG” in following table); finally, the undersea submerged section running between the Brevig Mission spit and the Teller spit was installed by Great Pacific Cable LLC (“GPC” in following table).

Segment	Hybrid alternative		
	Type	Approx. distance	Installed By (Crew(s))
Brevig Mission (BM) power plant to east side of BM airport	Buried	.5 miles	AVEC
East side BM airport to BM landfill	Overhead	1.4 miles	AVEC
BM landfill to end of BM spit	Buried	3.7 miles	STG
BM spit to Teller spit	Submerged (Note below)	.4 miles	GPC
Along Teller spit	Buried	.7 miles	STG
Base of Teller spit to Teller power plant	Overhead	.1 miles	AVEC
Total approx. distance		6.8 miles	

Note: for redundancy, two undersea cables were submerged in the segment connecting the two spits.

The installation complete and tested, on November 9, 2011 and just prior to commissioning of the intertie, a massive storm passed through this region of Alaska, causing significant damage to the community of Teller, and to the Teller spit and the surrounding area. Damage to the newly-installed intertie project includes loss of one junction cabinet; one of the two submerged cables connecting the two spits broke loose from its anchoring, and after the storm was observed floating in the channel between the two spits; and on one of the two submerged cables, two (of three) conductors were faulted. The intertie cannot be energized until repairs and re-inspection/retesting are completed.

Technicians sent to the site in June 2012 searched for but did not find the floating cable; they also tested the conductivity/continuity of the six conductors comprising the undersea cables (3 conductors on each of the two cables) at the junction boxes located on each spit, and failed to find conductivity on any of the six conductors. It is believed that both cables are damaged beyond repair, and that the casing on the cable

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earlier observed to be floating is severed or damaged in a manner that caused the cable to fill with water, in turn causing it to sink again to the seafloor.

Damages from the November 2011 storm have been formally declared a disaster by both state and federal governments. Pursuant to those declarations, AVEC applied for assistance from the Federal Emergency Management Agency (FEMA), for repair or replacement of the damaged intertie segments.

The intertie and both spits suffered further washout damage during storms in the fall of 2013, including significant damage to certain sections of the spits along the portion of the route that features trench-buried cable, further complicating the prospects for restoring the line as originally constructed. This storm event, as well, was declared a disaster and consequently the new damages were deemed eligible for FEMA assistance. A supplementary application was subsequently filed with FEMA for the additional damages.

**Funding, Costs and Cost Containment** – Funding was been provided by Denali Commission and USDA RUS grants to AVEC, and matching cash contributions from AVEC, shown as follows:

<b>Funding and Costs: Project 70C/1302 Brevig Mission – Teller Intertie</b>	<b>Federal portion of award</b>	<b>AVEC match portion</b>	<b>Total All Sources</b>
DC award 0049-DC-2002-I2 (project 70C)	\$ 359,130		\$ 359,130
DC award 349-07 (project 70C)	\$ 544,031	\$ 54,403	\$ 598,434
DC award 1302	\$ 1,992,350	\$ 209,235	\$ 2,201,585
USDA – Rural Utilities Service	\$ 1,520,576		\$ 1,520,576
<b>Total Funding (Budget) to date</b>	<b>\$ 4,416,087</b>	<b>\$ 263,638</b>	<b>\$ 4,679,725</b>
DC award 0049-DC-2002-I2	\$ 359,130		\$ 359,130
DC award 349-07	\$ 544,031	\$ 54,403	\$ 598,434
DC award 1302	\$ 1,992,350	\$ 259,788	\$ 2,252,138
USDA – Rural Utilities Service	\$ 1,520,576		\$ 1,520,576
<b>Total Actual Costs to 12/31/2013</b>	<b>\$ 4,416,087</b>	<b>\$ 314,191</b>	<b>\$ 4,730,278</b>
<b>Costs in excess of funding</b>	<b>\$ 0</b>	<b>\$ 50,553</b>	<b>\$ 50,553</b>

Total project costs (\$4,730,278) exceed total project funding (\$4,679,725) by \$50,553. There are no federal funds to de-obligate on award 1302.

Currently no cost containment benchmarks have been established by the Denali Commission for projects of this type. The functionality of this project, which was intended energize two communities with the output of a single power plant, meets the guidelines of selecting projects that maximize cost benefit criteria established by the Commission.

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**Problems Encountered/Lessons Learned** - Obtaining the easements across the Native allotments was a long and arduous process. It took considerably more effort than was anticipated and over four years to achieve. The resulting delay complicated all aspects of the project and will result in an increased cost for construction. In the planning for future projects, Native allotments and other properties with restricted deeds under the control of the BIA should be avoided, if possible. In cases where this is not possible, such as in the overland and hybrid alternatives of this project, site control should be achieved during planning and design phases.

As the intertie design reached completion, it became apparent that a standby backup power plant is required to provide power to Teller during times when the intertie is not available. The scope of all active and future intertie grant awards should include procurement of a standby backup power plant for each community connected by intertie to a prime power plant, along with construction of the intertie itself. Alternatively, this scope could be included in the award for the prime power plant, or in another award.

**Project Outcomes and Conclusions** - As of this point FEMA has agreed to fund either a replacement intertie to serve both communities, or an alternative project in Teller consisting of an upgraded power plant and bulk fuel storage tank farm. AVEC is evaluating options based on lessons learned during the development of the intertie project, including extensive work with FEMA to estimate the cost to repair the line to pre-storm condition.

Due to the repeated nature of the damage, and expected continued exposure to increasing (in frequency and/or size) storm events without the traditional natural barrier heretofore provided by reliable sea ice, FEMA will not approve rebuilding the line in the previous alignment (the “hybrid” alternative). Further, due to the high cost of constructing, and difficulty of maintaining, a replacement intertie along one of the other alternative alignments/routes (either around Grantley Harbor, or buried in the ocean floor across Grantley Harbor), AVEC is now abandoning the concept of reconnecting the two communities with an intertie. The remaining intertie sections already in place will remain for possible future use, to be energized from either the Brevig Mission power plant or the Teller power plant, without interconnection with the other in each case.

AVEC is preparing plans to upgrade the Teller power plant, to include possible replacement, in order to realize long-needed improvements in efficiency and reliability of electric service in that community. New or upgraded bulk fuel storage facilities would need to be provided along with the power plant improvements. Site evaluation, project scope definition, and order-of-magnitude cost estimate efforts are now underway. A substantial portion of the funding for this infrastructure project is expected to come from the disaster assistance funding requested from FEMA.